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PALO ALTO, CALIFORNIA

DEPARTMENT OF GENETICS  
*School of Medicine*

September 26, 1960

National Aeronautics and Space Administration

Dr. Homer Newell  
1520 ~~Beth~~ Street, N.W.  
Washington, D.C.

Dear Homer:

This is to Meeting 3 of the Planetary Sciences Subcommittee.

I think we are doing very well in the programming for the 1962 planetary probes and this applies also to 1964 Venus insofar as we really should not count on a contradiction of the present estimates of a high surface temperature. If the surface is hot, then the main item of biological interest might be the possibility of a biologically inhabited layer as an aerosol in or beneath the reflecting clouds. However, I suspect that even for this possibility, the best approach is just the kind of atmospheric chemical analysis that is on the books anyhow. 1964 Mars continues to bother me, especially the virtues of a drop sonde and whether this should include a biological test. What about another possibility that I do not believe was discussed at the meeting - a drop designed to culminate in a sustained flight at relatively low altitude, say about one kilometer. Pictures from this height could give another order of surface detail which should be extremely valuable in planning the major Saturn-boosted missions later on. For lift, I was thinking either of a balloon-or a kite-type of design which should require a minimum of power. The main poser is whether the information channel to such a mission would be large enough to recover some photographs. This device could, of course, also be collecting atmospheric data, at least as well as it could on the ground. And one supposes that the air foils might also do multiple service for antenna radiation and for collecting solar energy. Off-the-cuff, I would definitely prefer this to a biological experiment that might be so indecisive that it generated more confusion than conclusion.

Nevertheless, I think we can come up with a detector that will do some sort of a job in looking for microbial life. In thinking about this, I have assumed that we would be constrained to a few pounds of instruments and a total information capacity of a few kilobits. Since we are relying so heavily on these premises, I think it would be extremely important to have a carefully considered estimate of the actual capabilities of a Martian drop sonde and I hope that you can get this as the basis of further consultation.

I am enclosing a sketch of the small instrument; there are many improvements that we could and should think of if we had some more leeway in weight and data transmission.

I will also be sending a copy of this letter and the sketch to JPL for their advice.

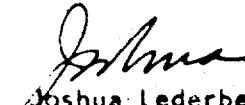
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The minutes on Meeting 3 made some mention of a further meeting, presumably in October. I was not sure whether you intended to invite your consultants to this; it happens that I will be in Princeton from Sunday evening, October 16 to Wednesday evening, October 19 and could route my trip via Washington at either end if this could be of any help for further consideration of these pressing questions.

Yours sincerely,

  
Joshua Lederberg  
Professor of Genetics

JL/jh  
Enc.

cc: Jet Propulsion Laboratories

*Pete Davies*